



American Conservation Experience

2900 North Fort Valley Road, Flagstaff, AZ 86001

ACE Project Report

For

**Tonto National Forest, Arizona Trail Association
and Arizona State Parks**





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Title of Project: 4 Peaks Trail Maintenance

Award Contract Number: ASP NM11021

Project Partner: Paul Burghard

Location: 4 Peaks Wilderness, Tonto National Forest

Dates: January 17 - May 1, 2013

Total Days worked: 56

Total Hours Contributed for AZ State Parks: 2,800

Total Hours Contributed for Arizona Trail Association: 640

Total Hours Donated by ACE: 1,840

Crew Supervisor: Kean Ruane

ACE Trails Trainers: Mark Loeth, Adam Scherm

Project Overview: The Arizona Trail travels through the central part of the state in the 4 Peaks Wilderness, part of the Tonto National Forest. This is section #20 of the AZ Trail, and is 19.5 miles in length. ACE partnered with the AZ Trail Association, AZ State Parks, and the Tonto National Forest to undertake an ambitious maintenance project covering the section of trail in most need of work. This section was 8 miles in length, and can be viewed on the cover page (trail shown in grey).

The eight mile stretch of trail ACE was tasked to work on was in desperate need of brushing and tread re-establishment. In many places the brush had completely overgrown the trail and hiking through was a challenge. In other places, where the trail existed on steep side slopes, sloughing had narrowed the trail significantly. This trail narrowing had created safety concerns for trail users, especially horse back riders.

The project began in January, and the first few weeks of the project were performed in often snowy conditions. At times the tread surface was covered in snow and only brushing could be performed. As the project progressed, the snow melted leaving ideal working temperatures. Throughout the spring, the melting snow provided water in the drainages for the crews' back country camps.

The final work hitch found the crew constructing retaining walls. These walls were built in an area with very steep, rocky cross slopes. The two sections of trail the crew re-stabilized were narrow and loose. The critical edge of the trail was all but gone, and what appeared to be firm trail was actually unstable and unable to support the weight of a hiker. This project was completed after the crew had finished the brushing, drainage, and tread work that was the original scope of the project.

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Specifications: The ACE crew followed the USFS trail standards throughout the length of this project. Tread width was consistent at 18-24 inches. All tread work performed was done with an out-slope. On flat sections of trail, the out-slope was established at 5%. Steeper sections of trail received more aggressive out-slope, to ensure that sheet flow occurs. The crew also spent time back-sloping the tread that was improved. Due to the steep hills, the back-slope acts to slow down and minimize sloughing and erosion. The back-slopes of the trail were reduced wherever possible.

Corridor Width was set at six feet wide, and the height of the corridor was 12 feet. The height took in to consideration horse back riders.

The dry stone retaining walls that were constructed also followed solid masonry principles. The foundation of the walls were dug in deep at a heavy batter. The stones in the wall were placed with strength and durability in mind. High, outside contact, broken joints and adequate surface contact were all rules the crew followed to ensure a quality structure. Foundation and cap stones were large and heavy, to support and strengthen the walls.

Objectives: The goal of this project was to perform trail maintenance on all of the eight miles of trail. The crew finished the initial goal with time remaining, which allowed them to work on the most dangerous sections of trail to armor them and increase visitor safety. Two walls were prioritized and a single eight day hitch was allocated to finish both walls. All of the work was completed on time, with no injuries or time lost.

Results and Measurable Accomplishments:

- Total Trail Mileage: 14.22
- Trail Mileage Brushed: 7.95
- Tread Mileage Repaired: 7.97
- Logs Cleared: 13
- Retaining Wall Constructed: 160 square feet
- Cubic feet rock quarried: 260



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There was more than just trail work to be done out in the 4 Peaks Wilderness. One of the crews back country camps had a great water source, the other did not. The crew at left is preparing to haul water from the first camp (Camp A) five miles to the other camp (Camp B). The project required accessing the more remote section of trail from Camp B, and the crew ensured they had enough water for this work. (Camps displayed on cover page)

Other challenges the crew faced involved the weather. The photo at right shows a crew member hiking ahead in the snow. The crew had to adjust to the conditions on the ground when weather inhibited a more straight forward approach to the work. During this work hitch, brushing was performed and tread work was left for when the crew could see the trail!





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The photo at left shows a great example of the typical conditions found on the trail. Brushing had not been performed recently, making the trail corridor extremely narrow and difficult to travel through.

The photo at right shows the same corridor after it had been brushed. The crew worked to re-establish the six foot wide corridor on the entire length of the project.





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At right, a crew member works to widen the trail corridor. This photo is a good example the type and thickness of the brush encountered on this project.

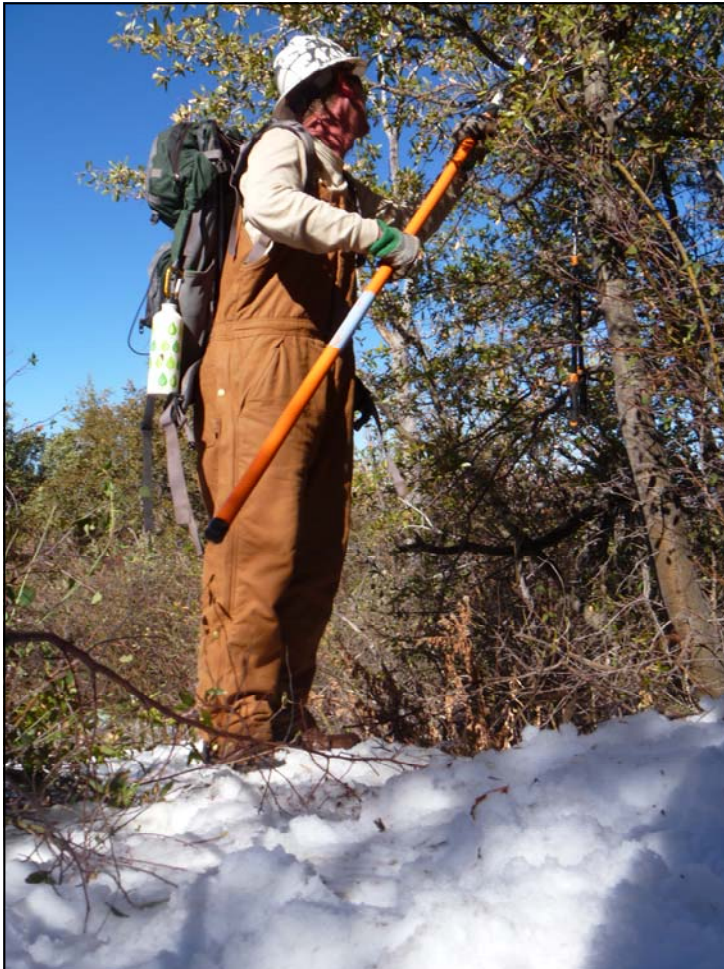


At left, multiple crew members working along the trail. Due to the remote nature of this project, the crew remained in eye-sight of each other throughout the day. This relative closeness ensured the safety of the crew members and that communication was constant.

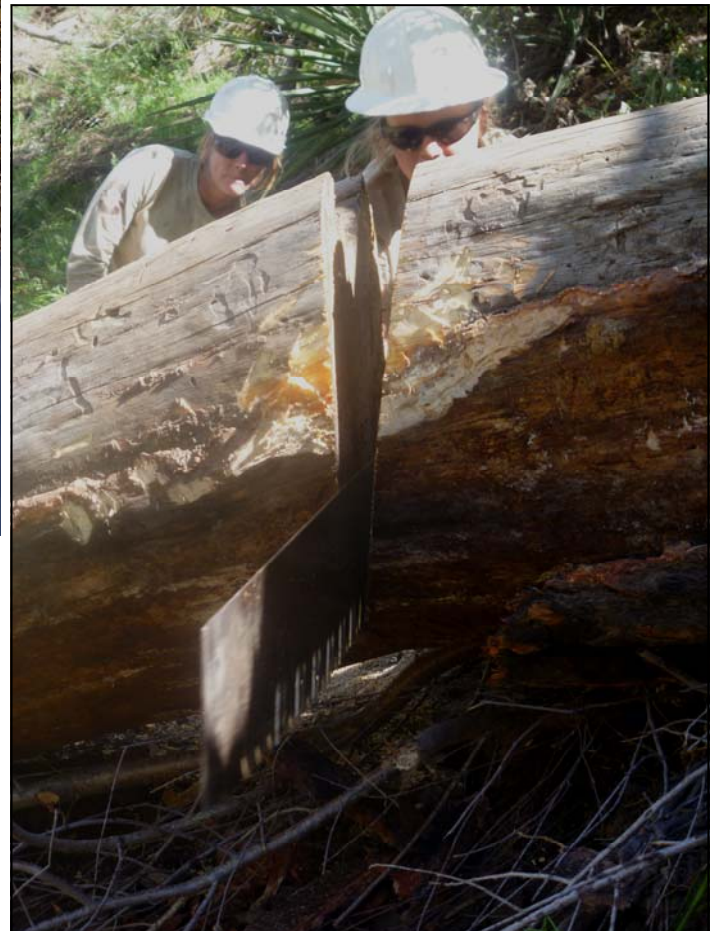


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While the smaller woody brush was thick, there was also tree trimming required to get the corridor up to Forest Service standards. Pole saws and larger hand saws were used to ensure the corridor was cleared to the proper specifications.



To maintain the proper corridor width, cross-cut saws were used to buck down trees out of the trail. At right, crew members work to remove one such log.

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Much of the tread on the trail needed to be widened and out sloped. The photo at left shows a crew member working to re-establish the trail in a sustainable fashion.

The photo at right shows two crew members working on the tread. The lower right portion of the photograph shows a small berm on the down hill side of the trail. The crew spent a lot of time removing berms such as these to allow sheet flow on the trail. Sheet flow preserves the natural hydrology of the land by allowing water to flow down on to the trail, and sheet off without the trail funneling the water down the tread way.



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The photo at right shows a crew member widening the tread. Notice the steep cross slope the trail exists on. These steep slopes, over time, slough rocks and soil down on to the trail. In many places, sloughing had occurred narrowing the trail below Forest Service specifications. Widening the trail creates a more sustainable and safe trail for users.



The photo at left shows the crew performing tread work.



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This page shows before and after photos of a section of trail that has been widened and out sloped. Sloughing has occurred on this trail



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The photo at left shows a section of trail that had been damaged by a rockslide. The photo shows large holes and trail tread that has been carried away. This slide occurred during the course of the project and the crew wanted to ensure that the trail would be passable for all users.

The photo at right shows the trail after the crew had cleaned up the rock slide. Smooth, sustainable tread has been re-established.



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The final eight day work hitch found the crew at a section of trail that had been compromised. At both work sites, there was evidence of retaining walls that had been built, and then lost due to the forces of nature. In both of these sites, the trail was dangerously narrow and unstable, and miss steps by hikers or horses would have serious consequences.



The photo above shows the first work site before the crew re-built the wall. Notice the narrow trail and the steep, dangerous hillside below. The photo at right shows the beginning of the wall. Large rocks were placed in the foundation to support the rock work in this steep, loose area.

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More photos of the crew working on the wall. Progress seemed slow at times, but the crew had an ideal source of angular stone just down the trail. The amount of rock gathered ensured they would have the material needed to complete the job.

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The photo at left shows crew members measuring the wall in preparation for the cap stones. The cap stones are large rocks that dictate the height of the wall and the level of the trail. They need to be large to withstand time and the pressure of horse traffic.

The photo at right shows the crew working hard to finish before the end of the hitch.



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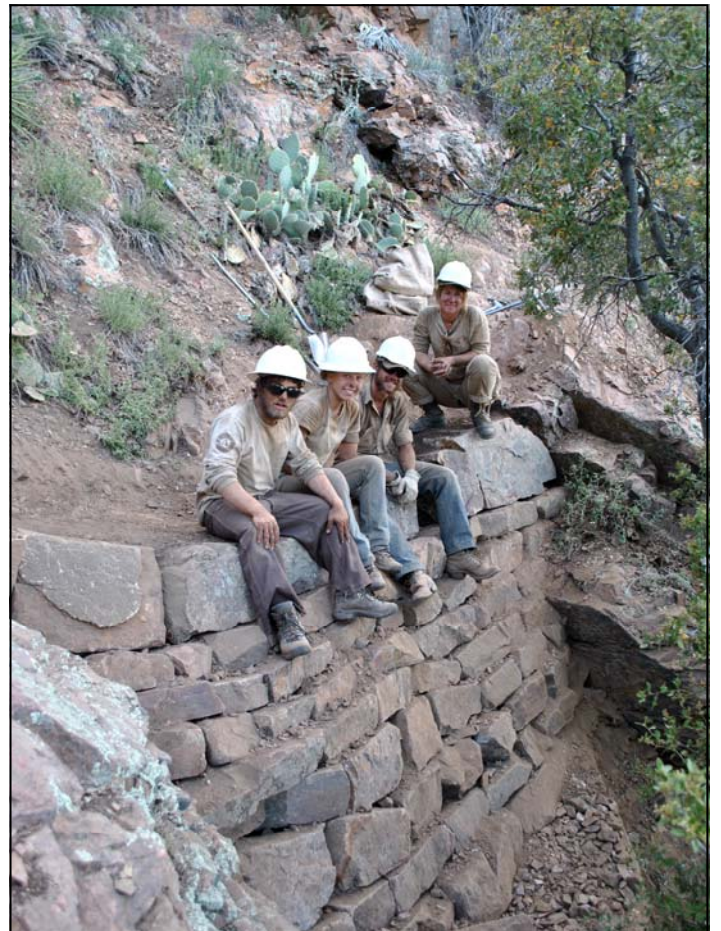


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This page shows the crew putting on the finishing touches to the wall and preparing to re-establish the tread. The photo below shows proud crew members enjoying their work.



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The photos shown here are from work site 2. Again, the wall had collapsed leaving a thin and unstable trail. The photo below shows the size of the damage. Notice the right side of the photo, underneath the Yucca, what remains of the original retaining wall.





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The photo at left shows the finished wall, supporting the trail tread and creating a safe travel way.

The photo at right shows the size of the wall and yes, more happy crew members.



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During the week of April 14 - 17, the International Trails Symposium was held in Fountain Hills, AZ. On Sunday, April 13, a mobile workshop was held on the AZ Trail in the 4 Peaks Wilderness. As part of the workshop, the hiking group from the Symposium hiked through our work segment and stopped to discuss the planning, logistics and management principles that have guided and affected this project. The photo at left shows Kean, 4 Peaks crew leader talking with the Symposium participants.



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4 Peaks crew on their last hike out. The crew members took a lot of pride in this project and enjoyed their time on the Arizona Trail.

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